

114 a third step of calculating a change rate of the reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light;

a fourth step of operating said processing means for a specified time till the change rate of the reflectance calculated in said third step reaches a specified value; and

a fifth step of monitoring said specified time in said fourth step and outputting a signal for causing maintenance to be performed with respect to said apparatus for manufacturing the semiconductor device when said specified time exceeds a limit value.

120 137. (Twice Amended) A method of controlling an apparatus for manufacturing a semiconductor device according to claim 128, wherein the change rate of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change rate of the reflectance.

REMARKS

I. Introduction

In response to the pending Office Action, Applicants have cancelled claims 43, 44, 47-49 and 50-53, without prejudice, and amended claims 41, 42, 45, 46, 54-56, 62, 63, 67, 68, 73-77, 82, 84-87, 90, 95, 97-100, 103, 104, 111, 113-116, 119, 120, 127, 128 and 137. More specifically, claims 54-56, 62, 63, 67 and 68 have been amended into independent format

including all of the limitations of the respective underlying base claims. No new matter has been added.

For the reasons set forth below, it is respectfully submitted that all pending claims are now in condition for allowance.

It is further noted that the instant Office Action incorrectly provided a two month time limit for responding to the Office Action, as opposed to the proper three month time period. Accordingly, it is respectfully submitted that no extension of time fee is required for responding to the Office Action, as the instant response is being filed within the standard three month period. However, in the event that a one month extension of time is required for responding to the Office Action, Applicants hereby petition for the one month extension of time and request that the extension of time fee be charged to Deposit Account No. 50-0417.

II. The Rejection Of Claims 38-140 Under 35 U.S.C. § 112, Second Paragraph

Claims 38-140 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the present invention. In view of the comments set forth on page 2 of the Office Action, the phrase "a rate of change of a ratio" was amended back to "a change rate" as originally set forth in the claims prior to Applicants' previous response.

Turning to the use of the term "predetermined" and "proper" in the pending claims, as noted in Applicants' previous response, it is respectfully submitted that the use of these terms does not render the claims indefinite. Often times terms such as "predetermined" and "predefined" are utilized in claims to represent a desired operating condition that can vary based on the given application or operating conditions. Indeed, it is improper to require the Applicants

to unduly limit the claim by quantifying, for example, a desired range that is variable. In the instant claims, the acceptable ratio of reflectance is predetermined based on the electrical properties of the semiconductor region being acceptable (i.e., proper). There is nothing ambiguous about the language, and one of skill in the art would readily understand the scope of the claims. Nothing more is required.

"It is well known that claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation". *In re Okuzawa*, 537 F.2d 545, 548 (CCPA 1976). For example, in *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565 (Fed. Cir. 1986), the Federal Circuit held that the phrase an "article *so dimensioned* as to fit in space" was definite, without requiring any further limitations regarding the language "so dimensioned" in the claim. It is respectfully submitted that such language is analogous to the language in question in the instant application, and that this is merely one example of comparable language that has been deemed definite by the Federal Circuit. As such, it is again respectfully submitted that the currently pending claims are not rendered indefinite as the result the use of the terms in question.

Finally, it is noted that a search on the USPTO's website for patents that contain the word "predetermined" in the claims from 1976 to date results in over 490,000 hits. Clearly, the use of the term does not render claims indefinite.

III. The Rejection Of The Claims Based On Grimbergen

Claims 49, 56-61, 63-67, 78-83, 112, 122-126 and 129-140 were rejected under 35 U.S.C. § 103 as being unpatentable over USP No. 6,129,807 to Grimbergen. Furthermore, claims 41-42, 45, 46, 52-55, 62, 68, 73-77, 84-100, 101-111, 113-121, 127 and 128 were rejected

under § 103 as being unpatentable over USP No. 5,706,094 to Maris in view of Grimbergen. For the following reasons, Applicants respectfully submit that Grimbergen is not prior art to the instant invention, and therefore both of the foregoing rejections must be withdrawn.

The instant application claims priority to four different Japanese priority documents, namely, JP 8-296592; JP 8-350612; JP 9-015382; and JP 9-189841. The filing dates of these priority documents are: 11/8/96; 12/27/96; 1/29/97 and 7/15/97, respectively. In contrast, the earliest effective filing date of Grimbergen is October 6, 1997. Thus, the effective filing date of Grimbergen is later than the filing dates of the priority documents, and therefore Grimbergen is not prior art to the instant application.

Applicants submit herewith a certified translation of each of the foregoing priority documents so as to perfect the claim of priority.

Based on the foregoing, it is respectfully submitted that Grimbergen is not prior art to the instant application and therefore the rejection must be withdrawn.

It is noted that the claims rejected based solely on Maris have been cancelled, without prejudice.

IV. Conclusion

Having fully and completely responded to the Office Action, Applicants submit that all of the claims are now in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's

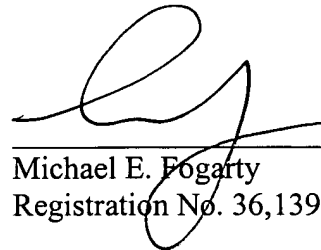
amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

Date: _____

By: _____



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please cancel claims 43, 44, 47-49 and 50-53, without prejudice, and amend claims .

Please amend claims 41, 42, 45, 46, 54-56, 62, 63, 67, 68, 73-77, 82, 84-87, 90, 95, 97-100, 103, 104, 111, 113-116, 119, 120, 127, 128 and 137 as follows:

41. (Twice Amended) An optical evaluation method for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a [rate of change of a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a plasma etching process performed with respect to said semiconductor region.

42. (Twice Amended) An optical evaluation method for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a [rate of change of a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a light dry etching process for removing a damaged layer caused by plasma etching performed with respect to said semiconductor region.

45. (Twice Amended) An optical evaluation method for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a [rate of change of a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a process of forming an insulating film on said semiconductor region.

46. (Twice Amended) An optical evaluation method [according to claim 38,] for evaluating processing performed with respect to a substrate having a semiconductor region in a chamber, said method comprising the steps of:

supplying measurement light to the semiconductor region of said substrate in said chamber;

intermittently supplying exciting light to said semiconductor region; and

calculating a [rate of change of a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said processing is a dry etching process for removing an insulating film from a top surface of said semiconductor region.

54. (Amended) A method of manufacturing a semiconductor device [according to claim 53], said method comprising:

a first step of forming a substrate having a semiconductor region;

a second step of evaluating an optical property of said semiconductor region;

a third step of performing an etching process with respect to said semiconductor region;

and

a fourth step of controlling a condition for said etching process based on an optical property of said semiconductor region evaluated in said second step;

wherein said second step includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and
calculating a change rate of a reflectance of the measurement light by dividing a
difference between the respective reflectances of the measurement light in the presence and
absence of said exciting light supplied to said semiconductor region by the reflectance of the
measurement light in the absence of the exciting light;

wherein the change rate of the reflectance of the measurement light at a specified energy
value of the measurement light which provides a near extremal value in a spectrum of the change
rate of the reflectance of the measurement light is calculated in said step of calculating the
change rate of the reflectance; and

wherein said specified energy value of the measurement light is any value included In a
range of 3.2 to 3.6 eV.

55. (Amended) A method of manufacturing a semiconductor device [according to claim
50], said method comprising:

a first step of forming a substrate having a semiconductor region;
a second step of evaluating an optical property of said semiconductor region;
a third step of performing an etching process with respect to said semiconductor region;
and
a fourth step of controlling a condition for said etching process based on an optical
property of said semiconductor region evaluated in said second step;

wherein said second step includes the steps of:

supplying measurement light to said semiconductor region;
intermittently supplying exciting light to said semiconductor region; and

calculating a change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light;

wherein said exciting light is intermittently emitted at a frequency of 1 kHz or less in said step of supplying the exciting light.

56. (Amended) A method of manufacturing a semiconductor device [according to claim 49], said method comprising:

a first step of forming a substrate having a semiconductor region;

a second step of evaluating an optical property of said semiconductor region;

a third step of performing an etching process with respect to said semiconductor region;

and

a fourth step of controlling a condition for said etching process based on an optical property of said semiconductor region evaluated in said second step,

wherein dry etching [using] utilizing a plasma is performed in said third step.

62. (Twice Amended) A method of manufacturing a semiconductor device [according to claim 50], said method comprising:

a first step of forming a substrate having a semiconductor region;

a second step of evaluating an optical property of said semiconductor region;

a third step of performing an etching process with respect to said semiconductor region;

and

a fourth step of controlling a condition for said etching process based on an optical property of said semiconductor region evaluated in said second step;

wherein said second step includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light;

said method further comprising, prior to said second step, the steps of:

introducing an impurity at a high concentration into said semiconductor region of said substrate and depositing an interlayer insulating film on said semiconductor region; and

selectively removing said interlayer insulating film by plasma etching to form an opening reaching said semiconductor region,

wherein said third step includes performing light dry etching with respect to the semiconductor region exposed at a bottom surface of said opening to remove a damaged layer caused by said plasma etching and predetermining a proper range of the change rate [in ratio] of the reflectance of said measurement light when an electric property of the semiconductor region is proper and

said fourth step includes performing said light dry etching such that said change rate [in ratio] of the reflectance falls within said proper range.

63. (Amended) A method of manufacturing a semiconductor device [according to claim 49], said method comprising:

a first step of forming a substrate having a semiconductor region;

a second step of evaluating an optical property of said semiconductor region;

a third step of performing an etching process with respect to said semiconductor region;

and

a fourth step of controlling a condition for said etching process based on an optical property of said semiconductor region evaluated in said second step;

wherein:

said first step includes forming, as said semiconductor region, a first semiconductor region forming a part of a semiconductor element and a second semiconductor region to be subjected to optical evaluation,

said second step includes evaluating the optical property of said second semiconductor region,

said third step includes performing the etching process with respect to said first and second semiconductor regions simultaneously, and

said fourth step includes controlling the condition for said etching process based on the result of evaluating the optical property of said second semiconductor region.

67. (Amended) A method of manufacturing a semiconductor device [according to claim 49], said method comprising:

a first step of forming a substrate having a semiconductor region;

a second step of evaluating an optical property of said semiconductor region;

a third step of performing an etching process with respect to said semiconductor region;
and
a fourth step of controlling a condition for said etching process based on an optical
property of said semiconductor region evaluated in said second step;
wherein said first step includes composing a portion of said semiconductor region to be
subjected to optical evaluation of n-type silicon.

68. (Twice Amended) A method of manufacturing a semiconductor device [according to
claim 50], said method comprising:

a first step of forming a substrate having a semiconductor region;
a second step of evaluating an optical property of said semiconductor region;
a third step of performing an etching process with respect to said semiconductor region;
and
a fourth step of controlling a condition for said etching process based on an optical
property of said semiconductor region evaluated in said second step;
wherein said second step includes the steps of:
supplying measurement light to said semiconductor region;
intermittently supplying exciting light to said semiconductor region; and
calculating a change rate of a reflectance of the measurement light by dividing a
difference between the respective reflectances of the measurement light in the presence and
absence of said exciting light supplied to said semiconductor region by the reflectance of the
measurement light in the absence of the exciting light;

wherein said second step includes evaluating the change rate [in ratio] of the reflectance of measurement light by using an ellipsometric-spectroscope.

73. (Twice Amended) A method of manufacturing a semiconductor device having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a [rate of change in a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein the change rate [in ratio] of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change rate [in ratio] of the reflectance.

74. (Twice Amended) A method of manufacturing a semiconductor device having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and

calculating a [rate of change in a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change [in ratio] rate of the reflectance and said specified energy value of the measurement light is any value included in a range of 3.2 to 3.6 eV.

75. (Twice Amended) A method of manufacturing a semiconductor device having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

- supplying measurement light to said semiconductor region;
- intermittently supplying exciting light to said semiconductor region; and
- calculating a [rate of change in a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said exciting light is intermittently emitted at a frequency of 1 kHz or less in said step of supplying the exciting light.

76. (Twice Amended) A method of manufacturing a semiconductor device having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

- evaluating an optical property of said semiconductor region; and
- performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;
intermittently supplying exciting light to said semiconductor region; and
calculating a change rate [of change in a ratio] of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein a proper range of the change rate [in ratio] of the reflectance of said measurement light when an electric property of the semiconductor region is proper is predetermined, and

said heat treatment is performed in said step of performing the heat treatment with respect to the semiconductor region such that the change rate [in ratio] of the reflectance of said measurement light falls within said proper range.

77. (Twice Amended) A method of manufacturing a semiconductor device having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and
performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and
calculating a [rate of change in a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein a relationship between the change rate [in ratio] of the reflectance of the measurement light in said semiconductor region and an impurity concentration in said semiconductor region is predetermined, and

the heat treatment is performed with respect to said semiconductor device in said step of performing the heat treatment till the change rate [in ratio] of the reflectance of the measurement light in said semiconductor region reaches a value corresponding to a desired impurity concentration.

82. (Twice Amended) A method of manufacturing a semiconductor device having a semiconductor region with a structural disorder developed therein, said method comprising the steps of:

evaluating an optical property of said semiconductor region; and

performing a heat treatment for recovering said semiconductor region from the structural disorder, while controlling a condition for the heat treatment based on the optical property of said semiconductor region evaluated in said foregoing step;

said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;

intermittently supplying exciting light to said semiconductor region; and
calculating a [rate of change in a ratio] change rate of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light,

wherein said second step includes evaluating the change rate [in ratio] of the reflectance of the measurement light by using an ellipsometric spectroscope.

84. (Twice Amended) A method of manufacturing a semiconductor device according to claim 83, wherein said step of evaluating the optical property includes the steps of:

supplying measurement light to said semiconductor region;
intermittently supplying exciting light to said semiconductor region; and
calculating a change rate [of change in a ratio] of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

85. (Twice Amended) A method of manufacturing a semiconductor device according to claim 84, wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change rate [in ratio] of the reflectance.

86. (Twice Amended) A method of manufacturing a semiconductor device according to claim 85, wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 300 to 600 nm is calculated in said step of calculating the change rate [in ratio] of the reflectance.

87. (Twice Amended) A method of manufacturing a semiconductor device according to claim 84, wherein the change rate [in ratio] of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change rate [in ratio] of the reflectance.

90. (Twice Amended) A method of manufacturing a semiconductor device according to claim 84, wherein:

a relationship between an amount of introduced impurity and the change rate [in ratio] of the reflectance of said measurement light is predetermined by experiment, and

said impurity is introduced in said step of introducing the impurity into said semiconductor region such that the change rate [in ratio] of the reflectance of said measurement light reaches a value corresponding to a desired amount of introduced impurity.

95. (Twice Amended) A method of manufacturing a semiconductor device according to claim 84, wherein said second step includes evaluating the change rate [in ratio] of the reflectance of the measurement light by using an ellipsometric spectroscopy.

97. (Twice Amended) A method of manufacturing a semiconductor device according to claim 96, wherein said second step includes the steps of:

supplying measurement light to said semiconductor region;
intermittently supplying exciting light to said semiconductor region; and
calculating a change rate [of change in a ratio] of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

98. (Twice Amended) A method of manufacturing a semiconductor device according to claim 97, wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change rate [in ratio] of the reflectance.

99. (Twice Amended) A method of manufacturing a semiconductor device according to claim 98, wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 300 to 600 nm is calculated in said step of calculating the change rate [in ratio] of the reflectance.

100. (Twice Amended) A method of manufacturing a semiconductor device according to claim 97, wherein the change rate [in ratio] of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a

spectrum of the change rate of the reflectance of the measurement light is calculated in said step of calculating the change rate [in ratio] of the reflectance.

103. (Twice Amended) A method of manufacturing a semiconductor device according to claim 97, wherein:

a proper range of the change rate [in ratio] of the reflectance of the measurement light when an electric property of the insulating film is proper is predetermined by experiment, and

said fourth step includes forming the insulating film such that the change rate [in ratio] of the reflectance of the measurement light measured in said second step falls within said proper range.

104. (Twice Amended) A method of manufacturing a semiconductor device according to claim 97, wherein:

said second step includes measuring the change rate [in ratio] of the reflectance of the measurement light in the semiconductor region before said insulating film is formed thereon, and

said fourth step includes controlling a condition for the formation of the insulating film by remeasuring the change rate [in ratio] of the reflectance of the measurement light in said semiconductor region which varies with the progression of the formation of the insulating film and comparing a result of remeasurement with a result of measurement performed in said second step.

108. (Twice Amended) A method of manufacturing a semiconductor device according to claim 97, said method further comprising, after said fourth step, the step of:

judging the formed insulating film to be good or no good based on a relationship predetermined by experiment between the change rate [in ratio] of the reflectance of said measurement light and an electric property of the insulating film.

111. (Twice Amended) A method of manufacturing a semiconductor device according to claim 97, wherein said second step includes evaluating the change rate [in ratio] of the reflectance of the measurement light by using an ellipsometric spectroscope.

113. (Twice Amended) A method of manufacturing a semiconductor device according to claim 112, wherein said second step includes the steps of:

supplying measurement light to said semiconductor region through said insulating film;
intermittently supplying exciting light to said semiconductor region through said insulating film; and

calculating a change rate [of change in a ratio] of a reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said semiconductor region by the reflectance of the measurement light in the absence of the exciting light.

114. (Twice Amended) A method of manufacturing a semiconductor device according to claim 113, wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 600 nm or less is calculated in said step of calculating the change rate [in ratio] of the reflectance.

115. (Twice Amended) A method of manufacturing a semiconductor device according to claim 114, wherein the change rate [in ratio] of the reflectance of the measurement light of a wavelength of 300 to 600 nm is calculated in said step of calculating the change rate [in ratio] of the reflectance.

116. (Twice Amended) A method of manufacturing a semiconductor device according to claim 113, wherein the change rate [in ratio] of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate [in ratio] of the reflectance of the measurement light is calculated in said step of calculating the change rate [in ratio] of the reflectance.

119. (Twice Amended) A method of manufacturing a semiconductor device according to claim 113, wherein:

a proper range of the change rate [in ratio] of the reflectance of the measurement light when the removal of said insulating is properly completed is predetermined, and

said fourth step includes performing dry etching with respect to the insulating film such that the change rate [in ratio] of the reflectance of the measurement light measured in said second step falls within said proper range.

120. (Twice Amended) A method of manufacturing a semiconductor device according to claim 113, wherein:

said second step includes measuring the change rate [in ratio] of the reflectance of the measurement light in the semiconductor region when said insulating film is formed thereon, and

said fourth step includes controlling a condition for the removal of the insulating film by remeasuring the change rate [in ratio] of the reflectance of the measurement light in said semiconductor region which varies with the progression of the removal of the insulating film and comparing a result of remeasurement with a result of measurement performed in said second step.

127. (Twice Amended) A method of manufacturing a semiconductor device according to claim 113, wherein said second step includes evaluating the change rate [in ratio] of the reflectance of the measurement light by using an ellipsometric spectroscope.

128. (Twice Amended) A method of controlling an apparatus for manufacturing a semiconductor device comprising a chamber for containing a substrate having a semiconductor region, processing means for performing processing with respect to said substrate in said chamber, first light supplying means for intermittently supplying exciting light to the semiconductor region of said substrate placed in said chamber, a second light supplying means for supplying measurement light to said semiconductor region, and reflectance measuring means for measuring a reflectance of the measurement light supplied to said semiconductor region, said method comprising :

- a first step of supplying the measurement light to said semiconductor region;
- a second step of intermittently supplying the exciting light to said semiconductor region;
- a third step of calculating a change rate [of change of a ratio] of the reflectance of the measurement light by dividing a difference between the respective reflectances of the measurement light in the presence and absence of said exciting light supplied to said

semiconductor region by the reflectance of the measurement light in the absence of the exciting light;

a fourth step of operating said processing means for a specified time till the change rate of the reflectance calculated in said third step reaches a specified value; and

a fifth step of monitoring said specified time in said fourth step and outputting a signal for causing maintenance to be performed with respect to said apparatus for manufacturing the semiconductor device when said specified time exceeds a limit value.

137. (Twice Amended) A method of controlling an apparatus for manufacturing a semiconductor device according to claim 128, wherein the change rate [in ratio] of the reflectance of the measurement light at a specified energy value of the measurement light which provides a near extremal value in a spectrum of the change rate [in ratio] of the reflectance of the measurement light is calculated in said step of calculating the change rate [in ratio] of the reflectance.